I CLAIM AS MY INVENTION:

1. An X-ray detector comprising:

a plurality of individual sensor elements, each sensor element including an X-ray sensitive scintillator element which emits light dependent on X-rays incident thereon and a photo-electrical transducer optically coupled to said scintillator element for generating an electrical signal corresponding to said light;

said sensor elements being disposed in an arrangement wherein each scintillator element is adjacent to another scintillator element, said arrangement having intermediate areas separating adjacent scintillator elements; and

scintillator material disposed in said intermediate area.

2. A detector as claimed in claim 1 wherein said arrangement is a linear array.

3. A detector as claimed in claim 1 wherein said arrangement is a matrix array.

4. A detector as claimed in claim 1 wherein said adjacent scintillator elements are connected to each other by a compound which includes said scintillator material and which extends through said intermediate areas.

5. A detector as claimed in claim 4 wherein said adjacent scintillator elements and said compound are formed by a common piece of scintillator material.

6. A detector as claimed in claim 1 wherein said intermediate areas include an insulating area for reducing crosstalk between said adjacent scintillator elements, and wherein said insulation area extends only partially between respective sides of said adjacent scintillator elements facing each other.

7. A detector as claimed in claim 1 wherein said adjacent scintillator elements are connected to each other by a compound composed of scintillator material disposed in said intermediate areas, said compound having a height in said intermediate area in a range between 20% through 50% of a height of said adjacent scintillator elements.

8. A detector as claimed in claim 7 wherein said scintillator material has an X-ray absorption coefficient, and wherein a mathematical product of said height of said compound in said intermediate areas and said X-ray absorption coefficient has a value in a range between 0.15 and 0.50.

9. A detector as claimed in claim 1 wherein said sensor elements each have a side adapted to receive X-rays, and wherein said scintillator material is disposed in said intermediate areas at a side of said arrangement facing away from the respective sides of said sensor elements adapted to receive X-rays.

10. A two-dimensional X-ray detector comprising:

a plurality of individual sensor elements disposed in an arrangement of a plurality of intersecting rows and columns, each sensor element including an X-ray sensitive scintillator element which emits light dependent on X-rays incident thereon and a photo-electrical transducer optically coupled to said scintillator element for generating an electrical signal corresponding to said light;

each scintillator element in said arrangement being adjacent to another scintillator element, said arrangement having intermediate areas separating adjacent scintillator elements; and

scintillator material disposed in at least some of said intermediate areas.

11. A detector as claimed in claim 10 wherein respective intermediate areas between adjacent columns of said sensor elements are free of said scintillator material.

12. A computed tomography apparatus comprising:

a radiation source which emits X-rays from a focus, at least said focus being rotatable around a system axis in a circumferential direction;

a two dimensional detector for detecting said X-rays, comprising a plurality of individual sensor elements disposed in an arrangement of a plurality of intersecting rows and columns, each sensor element including an X-ray sensitive scintillator element which emits light dependent on X-rays incident thereon and a photo-electrical transducer optically coupled to said scintillator element for generating an electrical signal corresponding

to said light, each scintillator element in said arrangement being adjacent to another scintillator element, said arrangement having intermediate areas separating adjacent scintillator elements, and scintillator material disposed in said intermediate areas, said rows being disposed in at least some of said circumferential direction and said columns being disposed parallel to said system axis; and

an image reconstruction system for reconstructing an image from said electrical signals.

13. A method for operating a radiation detector, said detector comprising a plurality of individual sensor elements, each sensor element including an X-ray sensitive scintillator element which emits light dependent on X-rays incident thereon and a photo-electrical transducer optically coupled to said scintillator element for generating an electrical signal corresponding to said light, said sensor elements being disposed in an arrangement wherein each scintillator element is adjacent to another scintillator element, said arrangement having intermediate areass separating adjacent scintillator elements, and scintillator material disposed in said intermediate areas, said method comprising the steps of:

reconstructing an image from said electrical signals; and

in reconstructing said image, taking crosstalk caused by said scintillator material in said intermediate areas into consideration.

14. A method for manufacturing a detector for detecting X-rays comprising the steps of:

providing a layer of scintillator material;

selectively removing scintillator material from said layer to produce a plurality of separating channels with individual sensor elements respectively between said separating channels, said separating channels extending only partly through said layer to form a portion of respective intermediate areas between adjacent sensor elements, with a remainder of the intermediate areas formed by said scintillator material, each of said sensor elements having a sensor element face adapted to receive incoming X-rays, said layer having a layer side opposite to the respective faces; and

disposing a plurality of optoelectric transducers at said layer side, with the optoelectric transducers being respectively optically coupled to the individual sensor elements.

15. A method as claimed in claim 14 comprising additionally introducing a light reflective material into each of said separating channels.

16. A method as claimed in claim 14 comprising additionally introducing a light absorption material into each of said separating channels.